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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/602,779	06/24/2003	Tetsujiro Kondo	450100-04609	1681

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EXAMINER	
DUFFIELD, JEREMY S	
ART UNIT	PAPER NUMBER
2427	
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/602,779	KONDO ET AL.	
	Examiner	Art Unit	
	JEREMY DUFFIELD	2427	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *14 May 2010*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,2,4-11,29-38 and 55-58* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,2,4-11,29-38 and 55-58* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

1. Applicant's arguments filed 14 May 2010 have been fully considered but they are not persuasive.

In response to applicant's arguments that the given references do not teach "the movement amount…identifies flesh color", Page 16, lines 7-9, the examiner respectfully disagrees. Kim teaches extracting a skin color image from a still image video frame and dividing the image into a grid of blocks (Col. 4, lines 35-56). Tow teaches dividing an image into blocks and calculating a motion vector for each of the blocks (Col. 8, lines 14-65). Okada teaches dividing the image into blocks, extracting a flesh color image from a still image video frame, and calculating a motion vector for each of the blocks (Col. 7, lines 16-40; Col. 8, lines 15-59; Col. 9, lines 9-14, 40-52). A threshold value is used to discriminate significant blocks from non-significant blocks. The number of pixels in each block is counted and if the number exceeds the threshold value, then the block is determined to be significant and is kept. The only pixels that are extracted from the original image are pixels having a flesh-color. There are no pixels other than the flesh-colored ones in the extracted image and the only pixels that are counted are the flesh-colored pixels in each block. Therefore, the combination of the references teaches the aforementioned limitation.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 1, 2, 4, 5, 29-34, 55-58 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kim (US 6,289,110) in view of Tow (US 7,266,771) and further in view of Okada (US 5,907,361).

Regarding claim 1, Kim teaches an audience state estimation system (Fig. 1) comprising:

imaging device for imaging an audience and generating a video signal relative to the audience thus imaged (Col. 2, line 61-Col. 3, line 4; Col. 5, lines 36-47);

movement amount detection device for detecting a movement amount of said audience based on said video signal, i.e. determining motion information from video frames (Col. 3, lines 1-4, 14-29; Col. 4, lines 26-35);

wherein the movement amount detection device extracts a flesh-color area which identifies flesh color from said video signal, i.e. generating a skin color image frame from the video (Col. 3, lines 5-30; Col. 4, lines 35-55),

divides the extracted flesh-color area into blocks (Col. 3, lines 14-45; Col. 4, lines 50-65; Col. 5, lines 17-30), and

estimation device for estimating an audience state based on said movement amount, i.e. determining the nearest person looking at the camera (Col. 5, lines 17-30, 36-47).

Kim does not clearly teach the movement amount detection device calculates a movement vector for each of the divided blocks, wherein each of the divided blocks includes a plurality of pixels and each of the plurality of pixels identifies flesh color; and an estimation device for estimating an audience state based on a comparison result of said movement amount and a predetermined reference level.

Tow teaches dividing an area into blocks (Fig. 2, el. 201, 203, 205, 207, 209; Col. 8, lines 14-65),

calculating a movement vector for each of the divided blocks (Fig. 2, el. 201, 203, 205, 207, 209; Col. 8, lines 14-65); and

an estimation device for estimating an audience state based on a comparison result of a movement amount and a predetermined reference level, i.e. using a motion information template that corresponds to clapping (Col. 10, line 46-Col. 11, line 3).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Kim to include dividing an area into blocks, calculating a movement vector for each of the divided blocks; and an estimation device for estimating an audience state based on a comparison result of said movement amount and a predetermined reference level, as taught by

Tow, for the purpose of identifying a type of motion energy at a particular place in a video and presenting it to a viewer in a graphically intuitive manner (Tow-Col. 3, lines 29-35).

Kim in view of Tow does not clearly teach wherein each of the divided blocks includes a plurality of pixels and each of the plurality of pixels identifies flesh color.

Okada teaches a movement amount detection device extracts a flesh-color area which identifies flesh color from said video signal, i.e. an area is extracted based on the color of a face (Col. 7, lines 16-40; Col. 8, lines 15-27),

divides the extracted flesh-color area into blocks identifying flesh color (Col. 7, lines 44-67; Col. 8, lines 33-55), and

calculating a movement vector for each of the divided blocks (Col. 8, lines 55-59; Col. 9, lines 9-14, 40-52),

wherein each of the divided blocks includes a plurality of pixels and each of the plurality of pixels identifies flesh color (Col. 7, lines 27-41; Col. 8, lines 15-55).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Kim in view of Tow's movement amount detection device to include the movement amount detection device extracts a flesh-color area which identifies flesh color from said video signal, divides the flesh-color area into blocks, and calculates a movement vector for each of the blocks, wherein each of the divided blocks includes a plurality of

pixels and each of the plurality of pixels identifies flesh color, using the known method of extracting an area of a frame based on the color of a face, as taught by Okada, in combination with the audience estimation system of Kim in view of Tow for the purpose of providing improved correlation between an extracted area of an image and a preceding image (Okada-Col. 3, lines 23-30).

Regarding claim 2, Kim in view of Tow in view of Okada teaches the movement amount detection device determines movement information of the imaged audience based on said video signal (Kim-Col. 3, lines 1-4, 14-29; Col. 4, lines 26-35), and

using MPEG differential frames that store motion information in the form of motion vectors obtained by determining the difference between adjacent frames (Tow-Col. 6, lines 47-60; Col. 8, lines 14-65); and

wherein an average movement amount showing an average of magnitudes of the movement vectors is set as the movement amount (Tow-Col. 9, line 55-Col. 10, line 33).

Regarding claim 4, Kim in view of Tow in view of Okada wherein said movement amount detection device determines movement vectors of the imaged audience based on said video signal (Kim-Col. 2, line 62-Col. 3, line 4; Tow-Col. 6, lines 47-60; Col. 8, lines 14-65); and

calculating an average movement amount showing an average of magnitudes of the movement vectors (Tow-Col. 9, line 55-Col. 10, line 33), and

wherein a time macro movement amount is set as the movement amount of said audience, said time macro movement amount being an average of the average movement amounts in a time direction thereof, i.e. the motion vectors have a magnitude and direction over the time period of a frame or several frames (Tow-Col. 9, line 55-Col. 10, line 33).

Regarding claim 5, Kim in view of Tow in view of Okada teaches when said movement amount is larger than a predetermined level, said estimation device estimates said audience state to be in any one of states of beating time with the hands and of clapping, i.e. using a motion information template that corresponds to clapping (Tow-Col. 10, line 46-Col. 11, line 3).

Regarding claims 29, 30, 55-58, claims are analyzed with respect to claim 1. These are Markush claims that include estimating the audience state based on audio taken from the audience, data of which was assigned to the non-elected Group II of the Restriction/Election Requirement, and likewise all limitations dealing with audio will not be examined.

Regarding claim 31, claim is analyzed with respect to claim 1.

Regarding claim 32, claim is analyzed with respect to claim 2.

Regarding claim 33, claim is analyzed with respect to claim 4.

Regarding claim 34, claim is analyzed with respect to claim 5.

4. Claims 6-8 and 35-36 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kim in view of Tow in view of Tagawa (US 7,373,209) and further in view of Okada.

Regarding claim 6, Kim teaches an audience state estimation system (Fig. 1) comprising:

imaging device for imaging an audience and generating a video signal relative to the audience thus imaged (Col. 2, line 61-Col. 3, line 4; Col. 5, lines 36-47);

movement detection device for detecting movement of said audience based on said video signal (Col. 3, lines 1-4, 14-29; Col. 4, lines 26-35);

wherein the movement detection device extracts a flesh-color area which identifies flesh color from said video signal (Col. 3, lines 5-30; Col. 4, lines 35-55),

divides the extracted flesh-color area into blocks (Col. 3, lines 14-45; Col. 4, lines 50-65; Col. 5, lines 17-30); and

estimation device for estimating an audience state based on the movement of said audience (Col. 5, lines 17-30, 36-47).

Kim does not clearly teach a movement periodicity detection device for detecting movement periodicity of said audience based on said video signal; the movement periodicity detection device extracts a flesh-color area which identifies flesh color from said video signal, divides the flesh-color area into blocks, and calculates a movement vector for each of the blocks; and estimation device for estimating an audience state based on the movement periodicity of said audience, wherein each of the divided blocks includes a plurality of pixels and each of the plurality of pixels identifies flesh color.

Tow teaches using MPEG differential frames that store motion information in the form of motion vectors obtained by determining the difference between adjacent frames (Col. 6, lines 47-60; Col. 8, lines 14-65);

the motion vectors have a magnitude and direction over the time period of a frame or several frames, i.e. movement periodicity (Col. 9, line 55-Col. 10, line 33);

dividing an area into blocks (Fig. 2, el. 201, 203, 205, 207, 209; Col. 8, lines 14-65),

calculating a movement vector for each of the blocks (Fig. 2, el. 201, 203, 205, 207, 209; Col. 8, lines 14-65); and

estimation device for estimating an audience state based on a comparison result of the movement periodicity of said audience and a predetermined reference level, i.e. using a motion information template that corresponds to clapping (Col. 10, line 46-Col. 11, line 3).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Kim to include dividing an area into blocks, calculating a movement vector for each of the blocks; and wherein an average movement amount showing an average of magnitudes of the movement vectors is set as the movement amount of said audience, as taught by Tow, for the purpose of identifying a type of motion energy at a particular place in a video and presenting it to a viewer in a graphically intuitive manner (Tow-Col. 3, lines 29-35).

Kim in view of Tow does not clearly teach a movement periodicity detection device for detecting movement periodicity of said audience based on said video signal; and wherein each of the divided blocks includes a plurality of pixels and each of the plurality of pixels identifies flesh color.

Tagawa teaches detecting periodicity based on an audio signal, i.e. identifying a periodicity of a rhythm or beat in music based on the peaks of an auto-correlation function of the audio (Col. 13, lines 5-49).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Kim in view of Tow to include a movement periodicity detection device for detecting movement periodicity of said audience based on said video signal, using the technique taught by Tagawa in combination with the motion vector system taught by Kim in view of Tow, although in different fields of endeavor would provide a predictable variation to

the motion vector system and for the purpose of specifically identifying a type of motion for use in a video retrieval system.

Kim in view of Tow in view of Tagawa does not clearly wherein each of the divided blocks includes a plurality of pixels and each of the plurality of pixels identifies flesh color.

Okada teaches the movement amount detection device extracts a flesh-color area which identifies flesh color from said video signal, i.e. an area is extracted based on the color of a face (Col. 7, lines 16-40; Col. 8, lines 15-27),

divides the flesh-color area into blocks (Col. 7, lines 44-67; Col. 8, lines 33-55), and

calculates a movement vector for each of the blocks (Col. 8, lines 55-59; Col. 9, lines 9-14, 40-52);

wherein each of the divided blocks includes a plurality of pixels and each of the plurality of pixels identifies flesh color (Col. 7, lines 27-41; Col. 8, lines 15-55).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Kim in view of Tow in view of Tagawa's movement periodicity detection device to include extracting a flesh-color area which identifies flesh color from said video signal, dividing the flesh-color area into blocks, calculating a movement vector for each of the blocks identifying flesh color, wherein each of the divided blocks includes a plurality of pixels and each of the plurality of pixels identifies flesh color, using the known

method of extracting an area of a frame based on the color of a face, as taught by Okada, in combination with the audience estimation system of Kim in view of Tow in view of Tagawa for the purpose of providing improved correlation between an extracted area of an image and a preceding image (Okada-Col. 3, lines 23-30).

Regarding claim 7, Kim in view of Tow in view of Tagawa in view of Okada teaches the movement periodicity detection device determines movement vectors of the imaged audience based on said video signal (Tow-Col. 6, lines 47-60; Col. 8, lines 14-65; Tagawa-Col. 13, lines 5-49),

calculates an average movement amount showing an average of magnitudes of the movement vectors (Tow-Col. 9, line 55-Col. 10, line 33), and

detects an autocorrelation maximum position of the average movement amount (Tow-Col. 10, line 57-Col. 11, line 3; Tagawa-Col. 13, lines 5-49), and

wherein variance of the autocorrelation maximum position is set as said movement periodicity (Tagawa-Col. 13, lines 5-49).

Regarding claim 8, Kim in view of Tow in view of Tagawa in view of Okada teaches the variance is calculated using a signal in a frame range, said frame range being decided on the basis of the periodicity of said audience state to be estimated (Tow-Col. 9, lines 37-55; Col. 10, lines 45-67; Tagawa-Col. 13, lines 5-49).

Regarding claim 35, claim is analyzed with respect to claim 6.

Regarding claim 36, claim is analyzed with respect to claim 7.

5. Claims 9, 10, and 37 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kim in view of Tow in view of Tagawa in view of Okada and further in view of Lu (US 5,550,928).

Regarding claim 9, Kim in view of Tow in view of Tagawa in view of Okada teaches all elements of claim 6.

Kim in view of Tow in view of Tagawa in view of Okada further teaches a movement periodicity (Tow-Col. 9, line 55-Col. 10, line 33; Tagawa-Col. 13, lines 5-49).

Kim in view of Tow in view of Tagawa in view of Okada does not clearly teach a ratio of low-frequency component in the average movement amount is set as said movement periodicity.

Lu teaches subjecting an image to low-pass filtering (Col. 11, line 48-Col. 12, line 13).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Kim in view of Tow in view of Tagawa in view of Okada to include a ratio of low-frequency component in the average movement amount is set as said movement periodicity, using the low-pass

filtering technique of Lu in combination with the movement periodicity determining technique of Kim in view of Tow in view of Tagawa in view of Okada for the purpose of removing extraneous image noise thereby providing a more accurate movement periodicity (Lu-Col. 11, lines 63-67).

Regarding claim 10, Kim in view of Tow in view of Tagawa in view of Okada in view of Lu teaches a frequency range of the low-frequency component is decided according to the periodicity of the said average movement amount transformed to a frequency region to be detected, i.e. identifying the rate and rhythm of clapping (Tow-Col. 9, line 55-Col. 10, line 33; Tagawa-Col. 13, lines 5-49; Lu-Col. 11, line 48-Col. 12, line 13).

Regarding claim 37, claim is analyzed with respect to claim 9.

6. Claims 11 and 38 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kim in view of Tow in view of Tagawa in view of Okada and further in view of Stevens (WO 91/03912).

Regarding claim 11, Kim in view of Tow in view of Tagawa in view of Okada teaches all elements of claim 6.

Kim in view of Tow in view of Tagawa in view of Okada teaches determining the periodicity, rate, and rhythm of a set of motion vectors (Tow-Col. 10, line 46-Col. 11, line 3; Tagawa-Col. 13, lines 5-49).

Kim in view of Tow in view of Tagawa in view of Okada does not clearly teach the estimation device estimates said audience state to be in a state of beating time with the hands when said movement periodicity is larger than a predetermined level, and estimates said audience state to be in a state of clapping when said movement periodicity is not larger than said predetermined level.

Stevens teaches estimating a person to be in a state of beating time with the hands when said movement periodicity is larger than a predetermined level, and estimates a person to be in a state of clapping when said movement periodicity is not larger than said predetermined level, i.e. when a first loud or sharp sound is received a counter is started; when the counter reaches a predetermined level without the system receiving another loud or sharp sound, the system determines that the periodicity of the first and a future second sound would be too large to be clapping; when a second loud or sharp sound is received before the counter reaches the predetermined level, the system determines that the periodicity of the two sounds is within a sufficient range to be clapping (Abstract).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Kim in view of Tow in view of Tagawa in view of Okada to include the estimation device estimates said audience state to be in a state of beating time with the hands when said movement periodicity is larger than a predetermined level, and estimates said audience state to be in a

state of clapping when said movement periodicity is not larger than said predetermined level, using the technique taught by Stevens in combination with the motion vector system taught by Kim in view of Tow in view of Tagawa in view of Okada, although in different fields of endeavor would provide a predictable variation to the motion vector system and for the purpose of specifically identifying a type of motion for use in a video retrieval system.

Regarding claim 38, claim is analyzed with respect to claim 11.

Conclusion

1. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to JEREMY DUFFIELD whose telephone number is (571)270-1643. The examiner can normally be reached on Mon.-Fri. 8:00 A.M.-5:30 P.M. EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Scott Beliveau can be reached on (571) 272-7343. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

12 July 2010
JSD

/Scott Beliveau/
Supervisory Patent Examiner, Art Unit 2427